

PATENT COOPERATION TREATY

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PCT

**NOTIFICATION CONCERNING
THE FILING OF AMENDMENTS OF THE CLAIMS**
(PCT Administrative Instructions, Section 417)

Date of mailing (day/month/year)	22 July 2004 (22.07.2004)
Applicant's or agent's file reference	2F03177-PCT
International application No.	PCT/JP2003/014562
Applicant	PANASONIC MOBILE COMMUNICATIONS CO., LTD. et al

From the INTERNATIONAL BUREAU

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IMPORTANT NOTIFICATION

International filing date
(day/month/year) 17 November 2003 (17.11.2003)

1. The applicant is hereby notified that amendments to the claims under Article 19 were received by the International Bureau on:

15 July 2004 (15.07.2004)

2. This date is within the time limit under Rule 46.1.

Consequently, the international publication of the international application will contain the amended claims according to Rule 48.2(f), (h) and (i).

3. The applicant is reminded that the international application (description, claims and drawings) may be amended during the international preliminary examination under Chapter II, according to Article 34, and in any case, before each of the designated Offices, according to Article 28 and Rule 52, or before each of the elected Offices, according to Article 41 and Rule 78.

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What is claimed is:

1. (Cancelled)
2. (Cancelled)
- 5 3. (Cancelled)
4. (Cancelled)
5. (Cancelled)

10 1. (Added) An active antenna having a multilayer structure comprising:

an antenna substrate on which an antenna is disposed;
a circuit substrate on which an amplification circuit for a signal transmitted/received through said antenna; and

15 a heat radiation plate interposed between said antenna substrate and said circuit substrate,
wherein said heat radiation plate includes a communication hole that communicates said antenna substrate side with said circuit substrate side.

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2. (Added) The active antenna according to claim 1, wherein said antenna is disposed apart from said communication hole on said antenna substrate and is supplied power from said communication hole through a feed line.

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3. (Added) The active antenna according to claim 2, wherein said communication hole is slot-shaped, and said feed line is disposed in a direction

perpendicular to the longitudinal direction of the slot shape of said communication hole on said antenna substrate.

5 4. (Added) The active antenna according to claim 3, wherein said length in the longitudinal direction of said communication hole is determined based on both the thickness of said heat radiation plate and the frequency used of said antenna.

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5. (Added) An active antenna comprising:
an antenna;
a high-output amplifier that amplifies a signal and outputs the signal to said antenna;

15 a low-noise amplifier that amplifies the signal received by said antenna;

an antenna substrate that includes said antenna and a feeder circuit that feeds power to said antenna;

20 an RF substrate that is mounted with said high-output amplifier and said low-noise amplifier which are active devices; and

a heat radiation block inserted between said antenna substrate and said RF substrate,

25 wherein said antenna substrate and said RF substrate are connected through an electromagnetic field by a connection slot.

6. (Added) The active antenna according to claim 5, further

comprising:

 a plurality of said antennas;
 the same number of said high-output amplifiers as
 said antennas;
5 a splitter that splits a signal into as many signals
 as said antennas and outputs the signals to said
 high-output amplifier; and
 a combiner that combines the signals received by
 said antennas and outputs the combined signal to said
10 low-noise amplifier,
 wherein signals are spatially combined.

7. (Added) The active antenna according to claim 6, wherein
 a variable phase circuit is interposed between said
15 high-output amplifier and said splitter or between said
 high-output amplifier and said antenna.

8. (Added) The active antenna according to claim 6, wherein
 a variable gain circuit is interposed between said
20 high-output amplifier and said splitter or between said
 high-output amplifier and said antenna.

9. (Added) The active antenna according to claim 6, wherein
 a variable phase circuit is interposed between said
25 combiner and said antenna.

10. (Added) An active antenna manufacturing method
comprising:

a step of providing a slot-shaped through hole in
a heat radiation plate; and

a step of forming a multilayer structure comprising
an antenna substrate on which an antenna is disposed,
5 a circuit substrate on which an amplification circuit
for a signal transmitted/received through said antenna
and a heat radiation plate provided with a through hole
interposed between said antenna substrate and said
circuit substrate.